

### REMARKS/ARGUMENTS

Favorable reconsideration of this application, in light of the present amendment and following discussion, is respectfully requested.

Claims 1-25 are pending in the present application. Claims 19-23 are amended. Claims 24-25 are newly added. Claims 1-18 are withdrawn. Support for the amendments to Claims 7-8 and 19-23 is self-evident. Support for newly added Claim 24 can be found in the specification as published at least at paragraph [0073]. Support for newly added Claim 25 can be found in the specification as published at least at paragraph [0119]. Thus, no new matter is added.

The outstanding Office Action objected to Claim 22 under 37 C.F.R. § 1.75(c) for improper form; rejected Claims 19-23 under 35 U.S.C. § 102(e) as anticipated by Awano et al. (U.S. Patent No. 6,818,107, herein "Awano"); rejected Claims 19-23 under 35 U.S.C. § 102(b) as anticipated by Masanobu et al. (JP 2003-033646, herein "Masanobu"); rejected Claims 19-20 and 22-23 under 35 U.S.C. § 102(b) as anticipated by "Low Current Density Electrochemical Cell for NO Decomposition" by Awano et al. (International Conference on Solid State Ionics, Materials and Processes for Energy and Environment, July 2001, page 183, herein "Awano 2"); and rejected Claims 19-23 on the grounds of non-statutory obviousness-type double patenting as unpatentable over Claims 1-8 of Awano.

In response to the rejection to Claim 22 under 37 C.F.R. § 1.75(c) for improper form, Claim 22 is amended to correct the noted informalities.

Applicants respectfully traverse the rejection of Claims 19-23 under 35 U.S.C. § 102(e) as anticipated by Awano.

Amended independent Claim 19, recites, in part:

a chemical reaction component; and

a surface coating layer disposed on a surface of the chemical reaction component, wherein

the surface coating layer is configured to inhibit an ionization reaction of adsorbed oxygen.

Thus, the chemical reactor for subjecting a treatment substance to a chemical reaction includes a chemical reaction component and a surface coating layer disposed on a surface of the chemical reaction component. The surface coating layer is configured to inhibit an ionization reaction of adsorbed oxygen. One benefit of the above-noted feature is that the inhibition of the ionization reaction of adsorbed oxygen reduces the current needed for ionization of adsorbed oxygen which allows the treatment substance to be treated at higher efficiency and lower power consumption.

Turning now to the cited art, Awano describes a chemical reactor. However, Awano fails to describe a chemical reaction component and a surface coating layer disposed on a surface of the chemical reaction component. Instead, Awano describes an electrical chemical cell consisting of a three-layer structure of a cathode, a solid electrolyte, and an anode.<sup>1</sup> Awano is silent regarding a surface coating layer disposed on a surface of the chemical reaction component, much less a surface coating layer configured to inhibit an ionization reaction of adsorbed oxygen. In contrast, amended independent Claim 19 recites a chemical reaction component and a surface coating layer disposed on a surface of the chemical reaction component.

Accordingly, Applicants respectfully submit that amended independent Claim 19, and claims depending therefrom, patentably define over Awano. Therefore, Applicants respectfully request the rejection of Claims 19-23 under 35 U.S.C. § 102(e) be withdrawn.

In addition, Applicants respectfully traverse the rejection of Claims 19-23 under 35 U.S.C. § 102(b) as anticipated by Masanobu.

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<sup>1</sup> See Awano at column 2, lines 42-46.

As discussed above, amended independent Claim 19 recites a chemical reactor that includes a chemical reaction component and a surface coating layer disposed on a surface of the chemical reaction component.

Turning now to the cited art, Masanobu describes a chemical reactor. However, Masanobu fails to describe a chemical reaction component and a surface coating layer disposed on the surface of the chemical reaction component. Instead, Masanobu describes an electrochemical cell which consists of a three-tiered structure of a cathode, a solid electrolyte, and an anode.<sup>2</sup> Masanobu is silent regarding a surface coating layer disposed on a surface of the chemical reaction component, much less the surface coating layer configured to inhibit an ionization reaction of adsorbed oxygen. In contrast, amended independent Claim 19 recites a chemical reaction component and a surface coating layer disposed on a surface of the chemical reaction component.

Accordingly, Applicants respectfully submit that amended independent Claim 19, and claims depending therefrom, patentably define over Masanobu. Therefore, Applicants respectfully request the rejection of Claims 19-23 under 35 U.S.C. § 102(b) be withdrawn.

In addition, Applicants respectfully traverse the rejection of Claims 19-20 and 22-23 under 35 U.S.C. § 102(b) as anticipated by Awano 2.

As discussed above, amended independent Claim 19 recites a chemical reactor that includes a chemical reaction component and a surface coating layer disposed on a surface of the chemical reaction component.

Turning now to the cited art, Awano 2 describes an electrochemical cell. However, Awano 2 fails to describe a chemical reaction component and a surface coating layer disposed on a surface of the chemical reaction component. Instead, Awano 2 describes an electrochemical cell with an NiO-YSZ mixed oxide as a working electrode that covers a Pt

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<sup>2</sup> See Masanobu at paragraph [0007].

cathode. Awano 2 is silent regarding a surface coating layer disposed on the surface of the chemical reaction component, much less a surface coating layer configured to inhibit an ionization reaction of adsorbed oxygen.

Furthermore, the outstanding Office Action asserts:

Awano et al teach a chemical reactor for subjecting a treatment substance (NO) to a chemical reaction, wherein a surface coating layer (mixed NiO-YSZ) is formed on the chemical reaction component surface (cathode) and which **inherently inhibits** the ionization reaction of adsorbed oxygen on the surface of a chemical reaction component (cathode) where the chemical reaction of the treatment substance (NO) proceeds. (Emphasis added).<sup>3</sup>

Applicants respectfully submit that inherency has not been established in the outstanding Office Action. “The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic.” MPEP § 2112, *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993). Moreover:

To establish inherency, the extrinsic evidence “must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.”

*In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999).

As set forth in MPEP § 2112, “[i]n relying upon the theory of inherency, the examiner **must** provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” (Emphasis added). *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).

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<sup>3</sup> See outstanding Office Action at page 4.

Accordingly, for at least the above-noted reasons, Applicants respectfully submit that amended independent Claim 19, and claims depending therefrom, patentably define over Awano 2. Therefore, Applicants respectfully request the rejection of Claims 19-20 and 22-23 under 35 U.S.C. § 102(b) be withdrawn.

In addition, Applicants respectfully traverse the rejection of Claims 19-23 on the grounds of non-statutory obviousness-type double patenting as unpatentable over Claims 1-8 of Awano.

As discussed above, amended independent Claim 19 recites a chemical reactor for subjecting a treatment substance to a chemical reaction that includes a chemical reaction component and a surface coating layer disposed on a surface of the chemical reaction component. Amended independent Claim 19 further recites that the surface coating layer is configured to inhibit an ionization reaction of adsorbed oxygen.

Awano is silent regarding the above-noted feature. Awano does not describe a surface coating layer disposed on a surface of the chemical reaction component, much less a surface coating layer configured to inhibit an ionization reaction of adsorbed oxygen. Thus, Claims 1-8 of Awano do not disclose or suggest all of the features recited in amended independent Claim 19.

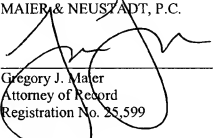
Accordingly, Applicants respectfully submit that Claims 19-23 are patentably distinct from Claims 1-8 of Awano. Therefore, Applicants respectfully request the rejection of Claims 19-23 on the grounds of non-statutory obviousness-type double patenting be withdrawn.

Newly added dependent Claims 24-25 each depend, directly or indirectly, from amended independent Claim 19, and patentably define over the cited references for at least the same reasons that amended independent Claim 19 does.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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